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| **MONITORING FACT SHEET** |
| **Title: Monitoring programme on non-commercial fish species (Descriptors 1, 4)** |
| **1. General** |
| 1.1 Subject area | **Programme name**: Biodiversity – Non-commercial fish**Programme ID**: BLKBG\_D014\_NonCommercialFish |
| 1.2 Definition/Description | *Definition of items monitored/description of general approach*Monitoring of fish species is conducted during the 2012-2014 monitoring programmes. The monitoring programme is focused primarily on the state of the fish population and the impact from human activities, but does not adequately address the pressure-impact relationship within the [DSPIR](http://root-devel.ew.eea.europa.eu/ia2dec/knowledge_base/Frameworks/doc101182) framework. The state and impact are measured by using relevant multi-metric indexes: species abundance index Shannon (H‘), (Shannon and Weaver, 1963); Fisher's alpha; Fisher et al. (1943); Gini-Simpson (1- λ) index; taxonomic diversity index of Warwick and Clarke (1995); biological health index (BHI); SACFOR expert assessment system and the 95 % percentile of the fish length distribution observed in research vessel surveys.Monitoring on the pressure from human activities from non-commercial fish populations should be developed in the future monitoring programmes. |
| 1.3 Competent authority/ies | *Which authorities are responsible (links to www)***Ministry of Environment and Waters (МоEW)** According to Art. 151, para. 1, p. 2k) of the Water Act and Art.101, para. 1 of Regulation № 1 / 11.04.2011 for monitoring of waters, the Minister of Environment and Waters organizes and manages water monitoring. According to Art. 3, para. 3, point 8 of the Regulation on the protection of the environment in marine waters (NOOSMV), the Minister of Environment and Waters approves the monitoring programs under Art. 11 and coordinates their development and implementation.**URL:** <www.moew.government.bg>**Black Sea Basin Directorate - Varna (BSBD - Varna) to the Ministry of Environment and Waters (МоEW)** According to Art. 155, paragraph 4b) of the Water Act and Art. 107, para. 1 of Regulation № 1 / 11.04.2011 for monitoring of waters, the Director of the BSBD - Varna plans and participates in the implementation of water monitoring, summarizes and analyses data, including that for the chemical and ecological status of water. According to Art. 3, para. 4, point 4 of the Regulation on the protection of the environment in marine waters (NOOSMV), the Director of the Black sea basin Directorate plans, develops and coordinates the monitoring programs under Art. 11.**URL**: <http://www.bsbd.org/> |
| 1.4 Monitoring institutions | *Which institutions carry out the monitoring etc. (links to www)***Institute of Oceanology – Bulgarian Academy of Sciences**Its responsibilities are defined in Art. 171, para. 2, point 3 of the Water Act and Art. 3, paragraph 11 of the Regulation on the protection of the environment in marine waters, approved by Decree № 273 from 23.11.2010, Prom. SG № 94 dated 30.11.2010, effective from 30.11.2010.**URL**: <http://www.io-bas.bg/index_en.html> |
| 1.5 Additional information | *Where can additional information be found (e.g. via a web link)*3a – Black Sea Commission (BSC)Web: <http://www.blacksea-commission.org/>3b – Black Sea transboundary diagnostic analysis (TDA)Web: <http://www.blacksea-commission.org/_tda2008.asp>*Regarding regional coordination remember this project and other relevant joined projects* |
| 2. Monitoring requirements and purpose |
| 2.1 Necessity | *Listed below are direct references to the monitoring requirements – EU directives, Black Sea Commission agreements, national plans, research programme requirements, other.**Delete/add rows*  |
| MSFDArticle 11Article 8 Annexes III | *Comments*On the basis of the initial assessment made pursuant to Article 8(1), Member States shall establish and implement coordinated monitoring programmes for the ongoing assessment of the environmental status of their marine waters on the basis of the indicative lists of elements set out in Annex III and the list set out in Annex V, and by reference to the environmental targets established pursuant to Article 10.The following characteristics should be monitored:**Annex III, Table 1:**—information on the structure of fish populations, including the abundance, distribution and age/size structure of the populations,The following pressure on non-commercial fish populations should be monitored under monitoring programme D1, 4 - Non-commercial fish:—selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing). |
| Habitat DirectiveArticle 11 | *Comments*Member States shall undertake surveillance of the conservation status of the natural habitats and species referred to in Article 11 with particular regard to priority natural habitat types and priority species. Consideration of nutrient inputs in the assessment of habitat impairments. |
| Black Sea CommissionBlack Sea SAP | *Comments***Convention on the Protection of the Black Sea Against Pollution****Black Sea Strategic Action Plan (BS-SAP)****Article XV** - The Contracting Parties shall, inter alia, establish through the Commission and, where appropriate, in cooperation with international organizations they consider to be competent, complementary or joint monitoring programmes covering all sources of pollution and shall establish a pollution monitoring system for the Black Sea including, as appropriate, programmes as bilateral or multilateral level for observing, measuring, evaluating and analysing the risks or effects of pollution of the marine environment of the Black Sea.**Web**: <http://www.blacksea-commission.org/_bssap2009.asp>**BSIMAP** - Black Sea Integrated Monitoring and Assessment Programme**Web**: <http://www.blacksea-commission.org/_bsimap_description.asp> |
| 2.2 GES criteria | *Li*st *relevant GES Criteria and characteristics [indicators]* (see *Commission Decision of 1. September 2010)*Species level1.1. Species distribution— Distributional range (1.1.1)1.2. Population size— Population abundance and/or biomass, as appropriate (1.2.1)4.3. Abundance/distribution of key trophic groups/species— Abundance trends of functionally important selected groups/species (4.3.1).6.2. Condition of benthic community— Multi-metric indexes assessing benthic community condition and functionality, such as species diversity and richness, proportion of opportunistic to sensitive species (6.2.2) |
| 2.3 Features, pressures and impacts | *List relevant features and pressures from MSFD Annex III***Annex III, Table 1**– information on the structure of fish populations, including the abundance, distribution and age/size structure of the populations,**Annex III, Table 2**– selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing). |
| 2.4 GES | *Assessment of GES (GES as defined in the article 9 reporting)*Overall GES definition – the non-commercial fish species are characterised by stable or increasing distribution, population size and relative abundance/biomass among the key trophic groups in the marine ecosystem, without giving rise to positive feedback and suppression in the related trophic levels.GES definition on Criterion 1.1. Species distribution – of high diversity of the non-commercial fish species in their natural distribution range, indicated by the threshold values determined in the Bulgarian Art. 9 GES report, Table I.1.1.1.GES definition on Criterion 1.2. Population size – the population abundance of the non-commercial fish species is indicative of high species abundance of the particular species in the sampling stations.GES definition on Criterion 1.6. Habitat condition – GES for the typical species and communities is indicated by high relative abundance and /or biomass as appropriate, with a stable and/or increasing trend.GES definition on Criterion 4.3. Abundance/distribution of key trophic groups/species – The productivity of the key predator species is stable or increasing and does not trigger positive feedback loop leading to decline of the populations in the related trophic levels. A significant proportion of the non-commercial fish species is larger than the target weight at first sexual maturation, measured during the fish surveys. The abundance trends in the functionally important species are stable or increasing without triggering positive feedback loop, leading to decline of the populations in the related trophic levels.Describe how the programme:1. addresses assessment needs for the relevant Descriptor(s) and targets – the programme addresses the assessment needs on Descriptor D1, 4 – Non-commercial fish, by providing monitoring data for assessment of GES on in relation to the non-commercial fish species and data for validation of threshold-based targets.
2. meets the needs of providing data/ information to support assessment of the Descriptor (or particular biodiversity component programme for D1, 4, 6) – the programme provides monitoring data for assessment of the descriptor. In addition, data for assessing the pressure, state and impact from monitoring programme D1, 4, 6 – Seabed habitats can be used;
3. contributes to determining distance from GES and trends in status – the existing monitoring programme checks the available monitoring data against threshold and trend-based targets to determine the distance from GES;
4. addresses natural and climatic variability and distinguish this from the effects of anthropogenic pressures – to distinguish between the natural and climatic variability the assessment of status on the non-commercial fish species should be correlated with the data providing from the monitoring on Descriptor D7 – Hydrographical conditions. To distinguish between human pressure and natural variability, the monitoring programme should provide information on pressure from fisheries (bottom trawling) based on the existing VMS (Vessel Monitoring Systems) records, records of illegal fishing gears (based on confiscation from inspectors from Executive Agency Fisheries and Aquaculture), data from the land-based sources of pollution, provided by the monitoring programme under D5 – Eutrophication (bottom hypoxia) and fish sampling data from “hotspots” (Varna and Burgas Bays, Kamchia River mouth) in relation to monitoring programme D8 – Contaminants in the marine environment (in particular data on indicator 8.1.1 for levels of contaminants in sediments and biota);
5. responds to risks of not achieving GES – the minimum requirement is to make the existing monitoring programme adequate to the requirements of the MSFD (in accordance with the Plans for information on GES and targets, listed below). The monitoring programme should provide data on the change in pressure and state of the marine environment in relation to Descriptor D1, 4 – Non-commercial fish and the related Descriptor D1, 4, 6- Seabed habitats, to be able to take appropriate measures, e.g. spatial protection measures.
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| 2.5 Environmental targetsMSFDHDBDWFD | *Relevant MSFD targets defined in the article 10 reporting***State targets**1.1.1 Targets – Distribution of Round goby (*Neogobius melanostomus*) and other demersal fish species is not significantly affected by human activities: the geographic and depth distribution of sensitive fish should meet individual indicator targets in a statistically significant proportion of species monitored.1.2.1 and 4.3.1 Targets: Abundance of the Round goby (*Neogobius melanostomus*) is not negatively affected by human activities.6.2.2 Targets. Coastal assessment area: Population abundance of non-commercial fish species is above the following threshold values, indicative of GES:* Total number of species (S) > 10
* Shannon index H' (log2) > 1,454
* Fisher's alpha (a) > 0,486
* Gini-Simpson (1- a) > 0,514
* Taxonomic distinctness (Δ\*) > 79,58

6.2.2 Targets. Shelf assessment area: Population abundance of non-commercial fish species is above the following threshold values, indicative of GES:* Total number of species (S) > 7.204
* Shannon index H'(log2) > 0.896
* Fisher's alpha (a) > 0.694
* Gini-Simpson (1- a) > 0.306
* Taxonomic distinctness (Δ\*) => 89.18

Impact targetsReduction of the by-catch mortalityOperational targetsConsider the necessity of creation of new and/or expansion of existing protected areas, including transboundary areas in consultation with the relevant Black Sea countries with particular attention to marine protected areas. Establish or extend these areas where necessary (Black Sea Strategic Action Plan target 14).Monitor and facilitate the progress in the implementation of nationally developed management plans of the protected areas (Black Sea Strategic Action Plan target 21)Support coordinated scientific studies, increase resources to marine science and improve capacity particularly through targeted training programmes supporting scientific projects/programmes (Black Sea Strategic Action Plan target 25). |
| BSC | (14) Consider the necessity of creation of new and/or expansion of existing protected areas, including transboundary areas in consultation with the relevant Black Sea countries with particular attention to marine protected areas. Establish or extend these areas where necessary.(21) Monitor and facilitate the progress in the implementation of nationally developed management plans of the protected areas.(25) Support coordinated scientific studies, increase resources to marine science and improve capacity particularly through targeted training programmes supporting scientific projects/programmes. |
| 2.6 Spatial allocation | *Table of where monitoring is required*

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|  | EEZ | 12-nm zone | Coastal waters | Transitional waters |
| MSFD | x | x | x | - |
| HD | x | x | x | x |
| WFD | - | - | - | x |
| BSC | x | x | x | - |

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| **3 Monitoring concept** |
| 3.1 General description of relevant subprogrammes in monitoring programme | *List subprogrammes monitored under this programme (only general description)*Mobile species - abundance and/or biomass. Parameters: Species composition, Species abundance (numbers of individuals and/or biomass), Species distribution (location).Mobile species - population characteristics. Parameters: Body size (length, weight), age, sex, fecundity rate, survival rate, mortality rateMobile species - state of habitats. Parameters: Habitat for the species (extent, suitability)Mobile species - mortality/injury rates from fisheries (targeted and/or incidental). Parameters: Rates of mortality, injury or other adverse effects from anthropogenic activitiesMobile species - mortality/injury rates from other human activities. Parameters: Rates of mortality, injury or other adverse effects from anthropogenic activities.Activities extracting living resources (fisheries including recreational, maerl, seaweed). Parameters: Distribution/extent in space and time, intensityEffectiveness of measures. |
| 3.2 Description of monitoring network | *Description + maps (describing the spatial resolution of the entire prog*Figure 1 Benthic and pelagic fish monitoring network in 2012The monitoring programme will be integrated with monitoring programme on Descriptor D1, 4, 6 - Seabed habitats. The sampling areas (polygons) will be located near the offshore the river mouths, pollution hotspots, large ports – areas with increased human pressure from fisheries and other human activities. In this way the programme will provide information on biodiversity (Descriptors 1 and 4) and if deemed feasible – tissue samples for the monitoring programme on contaminants in biota (Descriptor 8) and in fish as seafood for human consumption (Descriptor 9). |
| 3.3 Threats, activities and measures | *Which threats are identified*In marine waters, mortality due to bycatch levels in commercial fisheries represents the principle threat. Another threat is bottom hypoxia, an indirect effect from the eutrophication and resulting algal blooms. Finally, the contamination near the land- and sea-based sources of human activities.*Which human activities will be measured by the programme*Fisheries incl. recreational fishing (fish and shellfish) – there are monitoring studies of the pressure from bottom trawling on the seabed habitatsIndustry (discharges, emissions) – the monitoring on industrial land-based industrial point sources of pollution is already conducted by the Black Sea Basin Directorate. Agriculture and forestry (run-off, emissions) – monitoring on the river discharges of nutrients and contaminants from the Bulgarian Black Sea catchment is already conducted by the by the Black Sea Basin Directorate.Urban (municipal waste water discharge) - the monitoring on urban land-based industrial point sources of pollution is already conducted by the Black Sea Basin Directorate. Marine research, survey and educational activities – these include the monitoring activities conducted by the Institute of Oceanology in fulfilment with the requirements of the MSFD*Which measures will be measured by the programme*Commercial fisheries ships are equipped with VMS (Vessel monitoring systems) to track their positionsBlack Sea Basin Directorate is monitoring the industrial and urban points sources of pollution |
| 3.4 Data management | *How and where are data managed? How and where can data be accessed? (General description – programme level)*The type of data - Institute of Oceanology - Bulgarian Academy of Sciences and the Institute of Fisheries and Aquaculture have historical data collected during their research cruises. Historical data is on paper and the contemporary data are in electronic format. There is no national database providing data for the historic and contemporary indicators of the status of the marine environment. According to Art. 94, art. 95 and Art. 107, paragraph 1 of Ordinance № 1 data is reported to the Black Sea Basin Directorate - Varna, where they are stored, summarized and analysed at basin level.Data collected under the various projects funded by the European Commission in support of the MSFD are only available as metadata.- Method / mechanism used to make it available - for public access, the data is provided in accordance with the Access to Public Information Act. Information from the monitoring programme is publicly available on the website of BSBD - Varna form of periodic (annual) reports on the status of the marine environment. Data are available to the European Commission / European Environment Agency (EC / EEA) no later than six months after reporting to the competent authority (BSBD - Varna / MOEW). EC / EEA specify the method / mechanism for the provision of information and monitoring data.- Use rights for EC / EEA - Data and monitoring information under Art. 11 of the MSFD are available on the EC / EEA, in accordance with Art. 19 (3) of the MSFD.- INSPIRE standards used - institutions do not have a single database to store different data types in the format correspond to existing INSPIRE standards.- When the data will first be available - data will be available not later than six months after reporting them to the competent authority (BSBD Varna, MOEW), in accordance with Art. 19 (3) of the MSFD.- Frequency of update of the data - data is updated periodically (e.g. annually) when reported to the BSBD - Varna. |
| **4. Assessment** |
| 4.1 Assessments | *Existing assessments***Bulgarian reporting under Art. 8 of the MSFD****URL**: <http://cdr.eionet.europa.eu/bg/eu/msfd8910/>**BSC, 2008. State of the Environment of the Black Sea (2001 - 2006/7). Edited by Temel Oguz. Publications of the Commission on the Protection of the Black Sea Against Pollution (BSC) 2008-3, Istanbul, Turkey, 448 pp.****URL**: <http://www.blacksea-commission.org/_publ-SOE2009.asp> |
| 4.2 Assessment of GES | *Will assessment of GES be carried out by the programme*The program will provide initial data for the assessment of GES and also to assess the distance to, and progress towards achieving GES. The necessary changes in the program to provide data on GES are listed in Section 6. |
| **5. Literature** |
|  | *List of relevant literature*Zampoukas, N., H. Piha, 2011. Review of Methodological Standards Related to the Marine Strategy Framework Directive Criteria on Good Environmental Status. Publications Office of the European Union, 53 pp. Web: < <http://publications.jrc.ec.europa.eu/repository/handle/111111111/16069>>;Zampoukas, N., H. Piha, E. Bigagli, N. Hoepffner, G. Hanke, A. Cardoso, 2012. Monitoring for the Marine Strategy Framework Directive: Requirements and Options. Publications Office of the European Union, 42 pp. Web: <http://publications.jrc.ec.europa.eu/repository/handle/111111111/23169>  |
| **6. Activities required to implement the concept** |
| 6.1 Changes to the current monitoring programme | *Necessary changes and recommendations** The main problems of biodiversity of fish the Bulgarian Black Sea coast, the scarcity of data on the structure of fish communities depending on the type of habitat, range of distribution of species and the abundance and demographic structure of their populations. Lack of sufficient scientific information to date preclude the application of the indicators proposed for assessing progress towards achieving good environmental status for Descriptor 1 and Descriptor 3 respectively, and determining the reference condition and threshold values for some of them. At this stage, the indicators are not operational or need further development.
* better coordination with other institutions / organizations providing information related to the state or impact on the marine environment;
* ensuring sufficient capacity of the competent authorities and organizations (such as human resources, expertise and equipment) for the design and monitoring of the marine environment;
* development of indicators and criteria to assess the changes in the components of the marine environment in relation to climate change and to distinguish them from the effects of anthropogenic pressures; Providing the necessary and timely funding of the implementation of monitoring programs in accordance with the MSFD;
* improving the data and information management related to the state of the marine environment; improving access to national and regional databases and data from projects funded by the EC and other financial instruments.
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| 6.2 Gaps: GES information  | *If not yet adequate for data and information needs to assess GES, describe when the programme will be considered fully adequate* The programme is expected to provide adequate information on GES in time for next assessment in 2018. |
| 6.3 Plans: Plans for GES information | *If the programme is not considered fully adequate for data and information needs to assess GES, describe what plans are in place to make it fully adequate (eg. to fill gaps in data methods, understanding or capacity). Describe timeframe, priorities and obstacles.*The studies planned for the period 2015 - 2016 are expected to fill in the gaps in the available information of the state of the marine environment and on this basis - to develop proposals for improvement of the MSFD monitoring programmes. Also, it is planned to undertake sampling in parallel with fish surveys on Descriptor 1, during which will be collected and the necessary biological samples for commercial fish species.The results expected from the planned activities will partially fill the gaps in the data, needed to build part of the indicators criterion "size and age structure of populations," which will be performed simultaneously with fish sampling on D1.* Actions have been taken to **build the capacity** of the Black Sea Basin Directorate in connection with commitments on the implementation of the MSFD, including planning of monitoring programs, the programs of measures, etc.
* For the period 2015 - 2016 – expected **development of new modules to the water information system in Bulgaria**. One of the planned modules will include data and information on the implementation of the MSFD, including monitoring programs and subprograms, data from conducted monitoring, data for achieving GES, targets, indicators on different descriptors, measures about their implementation, etc.

**Improving the coordination with the other institutions / organisations** providing information related to the state and impact on the marine environment. |
| 6.4 Gaps: Target information  | *If not yet adequate for data and information needs to assess targets, describe when the programme will be considered fully adequate*The programme is expected to be adequate for data and information needs to assess targets in time for next assessment in 2018 |
| 6.5 Plans: Plans for information on targets | *If the programme is not considered fully adequate for data and information needs to assess targets, describe what plans are in place to make it fully adequate (eg. to fill gaps in data methods or capacity). Describe timeframe, priorities and obstacles.*The planned research described in Section 6.3. (Plans for information in GES) is expected to provide and update information / clarification of the targets. The results will be shared with Romania, to ensure greater coherence in subsequent implementation of the MSFD, and also within the Commission for Protection of the Black Sea against Pollution.On this basis, it is necessary Bulgaria and Romania to review and develop agreed targets based on agreed, if not harmonized, indicators of their marine waters, taking into account the assessment and recommendations of the Commission, as far as possible in 2014.Using regional fish stock assessments of fish stocks by the Scientific, Technical and Economic Committee for Fisheries (STECF), in determining DSMOS and objectives of the descriptor D3 (URL: <http://stecf.jrc.ec.europa.eu/reports/medbs>) . |